Service Innovation

A Roadmap for Practitioners

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Abstract

The service sector is the most important and fastest growing business sector of developed countries nowadays. Existing literature outlines important topics for future research in the field of service innovation. However, a lack of practical implications exists. Based on a research portfolio, classifying theoretical research questions in the field of service innovation, a roadmap for practitioners is developed. For this purpose, existing theoretical insights, service innovation driving forces, and key technology enablers are investigated. The roadmap depicts six areas that have to be considered by companies to cope with the on-going changes in the service sector and that have to be targeted within companies to exploit existing and emerging potentials for service innovations. Among these areas are the companies' organization and the evaluation of ideas and innovations. Due to the fact that quickly evolving trends need to be addressed promptly with the right solution, the latter area will clearly play a vital role in the future. In order to be innovative, companies have to spend their efforts wisely, not wasting energy in insufficient service innovation projects.

Keywords

Service Innovation; Roadmap; Service Innovation Research Framework

Introduction

Nowadays, services are dominating our economies and our professional as well as our personal lives. Services contribute 63.6% of the world's gross domestic product (GDP) by sectors and employ 41.9% of the total labor force (The World Factbook of the Central Intelligence Agency – CIA). The service sector is the most important and fastest growing business sector of developed countries. However, Chesbrough and Spohrer (Chesbrough and Spohrer 2006) identified that there is a lack of academic community in this field and furthermore that there is a lack of conceptual foundation. Ostrom et al. (2011) underline this call, suggesting that the time is right to begin to identify the most important white spots as researchers

in many disciplines reframe and realign their efforts regarding service. Service science can be considered as an emerging multidisciplinary field, focusing on the combination of fundamental science and engineering theories, models, and applications, aiming at enhancing and improving service innovation (Ostrom et al. 2011; Paton and McLaughlin 2008; Paulson 2006). Hence, service science strives after generating successful service innovations, which have been poorly understood and their impact has been neglected (Nam and Lee 2010). The contribution of Ostrom et al. (2011) on "research priorities for the science of services" reveals two findings that are relevant for this article. On the one hand, the article outlines the growing need to refine and promote global research agendas continuously. On the other hand, stimulating service innovation is among one of the top ten research priorities, according to their findings. Although, service innovation is important for companies to remain competitive and to ensure long-term success, it is poorly understood from an academic point of view. Research in this area does not provide any guidelines for practitioners to make use of the opportunities service innovation offers.

Literature provides multiple definitions for the term service innovation, outlining the need for a broad and inclusive definition, which is at least used for this article. Therefore, the term service innovation is unbundled, aiming at a clear understanding of the terms service and innovation. Afterwards, the different definitions are used to establish an integrated and aligned understanding.

Service can be regarded as a product that is not a good (Rathmell 1966). Hence, scholars define service based on the characteristics that differentiate it from goods. These characteristics are namely intangibility, heterogeneity, inseparability, perishability, and lack of

ownership (Carman and Langeard 1980; Edvardsson et al. 2005; Grönroos 1978; Kotler et al. 2001; Liu and Chen 2007; Lovelock and Gummesson 2004; Vargo and Lusch 2004). However, considering the definition provided by the service-dominant (S-D) logic's perspective, a service is a useful application of specialized competences (i.e. knowledge and skills) to provide benefit for another entity (Vargo and Lusch 2004; Lusch et al. 2008). Nam and Lee (2010) declare that the purpose of a service is to achieve value co-creation through the integration of customers as co-producers. Hence, service is an intangible asset co-created and exchanged in the same moment between a provider (or a provider system) and a consumer (e.g., customer) to satisfy his/her needs. Considering the individuality of each consumer's needs unveils the heterogeneity or variability of a service.

Coming to the term innovation, innovation is considered to be the process of combining or matching problems and needs with solutions that are relevant and new to these problems and the result of these activities. Innovation, as a result, describes the convincing match of new products and services with existing problems and needs (Kerka et al. 2009; Paton and Mclaughlin 2008b; Rickards 1985; Wahren 2004).

In compliance with these definitions, the term service innovation is defined as follows: Service innovation comprises new, better, or more effective services as well as the creative activities necessary to develop them. Specifically, service innovation is the generation, design, and exploitation of intangible assets as well as these assets themselves, which are co-created and exchanged between a provider and a consumer in the same moment to satisfy his/her individual needs.

Nowadays, one of the major problems is that practitioners do not know how to cope with the changing environment within the service sector. Emerging technologies change the way of how to run the business, and companies need to adapt these technologies and change their business accordingly. The key success factor can be seen in understanding existing theoretical findings and translating them into clear requirements for practitioners.

This article aims at enhancing the knowledge base of service science by bridging theory and practice. Based on the study conducted by Schwarz et al. (2012) on a service research innovation portfolio, this article develops guidelines for practitioners in the field of service innovation.

Related Work

Vargo and Lusch (2004b) introduced the service-dominant (S-D) logic, implying a shift from the historical goods-dominant (G-D) logic. The implications that come along with this shift from G-D logic towards S-D logic are important to understand the foundation of service science research. Acquisition of specialized competencies (e.g. knowledge and skills) is the fundamental unit of exchange. The customer becomes a co-producer during service delivery processes, instead of solely a recipient of goods. This alters the characteristics of firm-customer interaction, as the customer becomes primarily an operant resource, participating actively. Furthermore, S-D logic changes the role of goods, the way value is determined, and the source of economic growth. Hence, S-D logic can be considered the philosophical foundation of service science, leading to the fact that fundamental service science research is needed (Maglio and Spohrer 2008). While several scholars demand additional research on service related trends, challenges, and important topics (Ostrom et al. 2011), Chesbrough and Spohrer (2006) declare a lack of strong conceptual foundation regarding services and the need for a deep understanding of how to innovate in services.

The expansion of research in the field of service innovation resulted in a better understanding of practical issues, such as the significance of integrating customers as co-creators (Alam 2002; Nam and Lee 2010; Sørensen and Nicolajsen 2010), the influence and contributions of design theory (Lenfle 2004), the establishment of new service development (NSD) programs (Scheuing and Johnson 1989; Edvardsson et al. 2005; Alam and Perry 2002), or the development of different approaches to distinguish and classify service innovations (Lovelock 1983; Den Hertog 2000; Lenfle 2004). Considering service innovation to be the result of creative activities within companies, Gallouj et al. (1997) distinguished six approaches for innovations in services. The differentiation is based upon the degree of new or innovative elements, differentiating radical innovation, improvement innovation, incremental innovation, ad hoc innovation, recombinative innovation, and formalization innovation. In a similar vein, Den Hertog (2000) developed a four-dimensional model of service innovation. The basic argumentation

is that most service innovations can be characterized by the changes among these dimensions. The four dimensions are namely the service concept, the client interface, the service delivery system, and the technological options. This model fits well, classifying and investigating the results of service innovations.

Considering service quality and service engineering to be closely connected to service innovation, literature provides even more distinct evidence for the need of a roadmap for practitioners. Parasuraman et al. (1985) focused on service quality and future research implications in this field. They summarized the existing knowledge and derived directions for future research based on a conceptual model of service quality. The same can be seen for service engineering, which is the practical application of tools and methods within companies. Service engineering is closely connected to the so-called concept of service science, management, and engineering (SSME) (Wu and Wu 2010). Bullinger et al. (2003) state that the key focus of service engineering is the development of new services and structured the field of service engineering using six areas. On the one hand, general R&D management-related areas are investigated. On the other hand, the development of new services is embedded, concentrating on how to exploit new service innovations.

Furthermore, scholars focused on the investigation and identification of priorities for future research, but lacked to concentrate on practical implications.

Ostrom et al. (2011) – for instance – identified ten overarching research priorities for service science and indicated that stimulating service innovation is one of them. Their study is based on in-depth interviews and online surveys and focused on academics as well as business executives. Their findings show the relevance of service innovation in general and outline seven topic areas that are important in particular. However, a clear recommendation for companies and a more specific identification and classification of interesting starting points are missing.

Research Methodology

The overall objective of this article is to expand the knowledge base of service innovations by outlining a roadmap for practitioners regarding future research in this field. The development of this roadmap is an enhancement of the existing service innovation research portfolio, developed by Schwarz et al. (2012), and follows a distinct three-step approach.

First, survey results of Schwarz et al. (2012) are investigated. The study is based on the service innovation and transformation model, which follows a general systems theory. The model builds on an ITO (input – throughput (transformation system) – output) approach, including a feedback loop as well as environmental aspects. The model integrates reliable existing service innovation methods and models and outlines relevant aspects for the generation and exploitation of service innovations (Fig. 1).
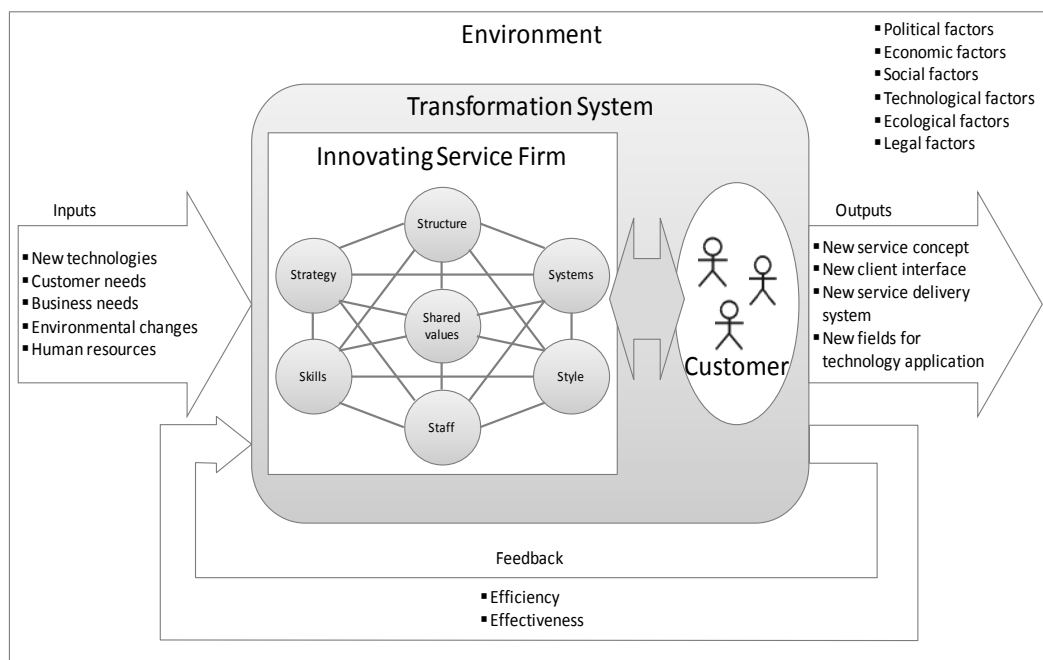

FIG. 1 SERVICE INNOVATION AND TRANSFORMATION MODEL

Second, with the research framework in place, specific driving forces and key technology enablers in the field of service innovation are derived. The driving forces unveil several aspects that are important for practitioners to understand the origin of service innovations. In addition, key technology enablers are observed. These enablers will lead to new fields for technology application and might therefore correlate directly to Den Hertog's (2000) way of thinking about service innovation.

Third, the respective roadmap for service innovation is generated by combining the survey's results, the driving forces, and the key technology enablers. It is discussed with experts and communicated to the scientific research community to follow rigorous research methodologies, providing insights into the current knowledge base of service innovation.

Investigation

Theoretical Insights

The study of Schwarz et al. (2012) is based on an explanatory investigation approach, questioning 122 researchers in the field of service innovation, to examine relevant theoretical topics for service innovation research. The topics are linked to the five dimensions of the underlying framework (see Fig. 1).

A hot topic for research regarding the input-related dimension is the assessment of skills and capabilities of employees for service innovation management. Future research should focus on topics that cover the prioritization as well as the previous identification of technological aspects and environmental changes. Furthermore, methods improving strategic foresight activities need to be developed or enhanced. Current aspects that can be considered important from a technology perspective might be cloud computing or gesture recognition, while environmental change might comprise energy-related aspects or aspects regarding future mobility.

Output-related research should focus on the relevance of training and personal responsibility to improve the performance of service innovations. The most important research questions that should be investigated in the near future are dealing with technology. On the one hand, it is important to develop methods that help identify new application possibilities for existing technologies. On the other

hand, it is important to identify approaches that increase customer acceptance of new technologies. In addition, the results indicate a need for specific methods to design new service concepts and outline the need to pay attention to design thinking. Scribing or ubiquitous usability might be starting points that have to be further investigated in the context of design thinking.

Regarding the transformation dimension of the service innovation and transformation model, a high priority area is the definition of structured processes for discontinuous service innovations. Discontinuous service innovations are important, as they change the role of the customer and the firm's value creation (Michel et al. 2008).

Analyzing the portfolio with respect to the feedback dimension reveals a comparatively high demand for methods to measure the economic value added (EVA) of new service delivery systems as well as the EVA generated through transferring and adapting existing technologies. Nowadays, many services are delivered through technologies. Hence, it is important to identify adaptable technologies as well as delivery concepts that provide benefit for both, customers as well as companies.

Looking at the environment dimension, it is important to develop sufficient methods that foster identification of ecological factors influencing service innovation. The development of methods or approaches that enable companies to identify influencing factors, as well as to interpret their specific influence, is an essential task. This finding is consistent with research needs in the field of strategic foresight.

Driving Forces

When it comes to the creation of service innovations, there are different approaches. Screening technical possibilities can be used to develop new service opportunities, and on the other hand, customer requests can be investigated to define useful services (Lenfle 2004). Screening technical possibilities comprises the whole range of options for new services which is necessary to answer the question "What can we do and how?" Technologies address the whole range for technology-pushed service innovations. The complementary question to create successful service innovations is "What should we do?" This question is answered by the second approach through

investigating customer needs and requests. This will be considered as customer-pulled service innovation. In addition, a third approach that reveals innovation needs is the business itself. Business-invented service innovations serve the needs of entities inside the company and strive to increase efficiency, cutting costs, etc. (Löffler, 2011).

Combining those questions results in the challenge "What will we do?" and integrates the complete range of potential service innovations being expected by customers and/or business and at the same time feasible through the application of technology.

In addition, environment-driven service innovations have to be considered. In most cases this kind of innovations significantly affect companies. Rennings and Rammer (2010) provide insight in the effect of environment-stipulated innovations on firm performance. They outline that environment-stipulated innovations lower profitability, due to the fact that the costs for development and implementation cannot be passed on prices (Rennings and Rammer 2010). However, it should be mentioned that this type of innovation might provide the basis for establishing competitive advantage within one's business if solutions to cope with new regulations, policies, and social standards are developed prior to competitors in a valuable, rare, and in-imitable manner.

Key Technology Enablers

Observing the key technology enablers of today, social networking, smart mobile communications, and cloud services will be unveiled. Each one is delivering outstanding growth-rates. All three taken together are creating nothing short of a game-changing revolution in the way services are created, delivered, and consumed.

Social networking: Since 2003 there has been a rise of an entirely new means of interaction; soon over a billion people will be sharing ideas and experiences on Facebook and other social networking sites such as Twitter and Google+. These tools themselves are now being embedded in other applications, making collaboration easy, quick, and cheap.

Smart mobile communications: There has been a rapid growth of smart mobile devices including Apple's iPhone and iPad since 2007. Massive growth in mobile applications in the consumer sector is now translating into parallel growth in the enterprise sector. People can now work efficiently and effectively from anywhere.

Cloud computing: Since 2008 the virtualization of infrastructure has accelerated rapidly. Organizations are already finding ways to exploit this, accessing the storage and computing capacity they require on demand, and with substantial cost benefits.

Each of the above three change enablers is supported by the development of other critical technology and infrastructure:

High bandwidth telecommunications networks: There are continuing global investments in high bandwidth networks, including fixed line and mobile. These networks enable new rich media service experiences (e.g. from providers such as Google's YouTube) and are critical for assuring the end-to-end service experience that consumers demand.

Big data: New ways have been developed to process massive amounts of data in near-real-time (such as Hadoop). Google now claims to be able to run ad hoc SQL queries on multi-terabyte datasets in seconds[1], enabling a whole new set of near real-time services.

Ultra-fast, low latency switches: Providers such as Cisco and Arista Networks have created new switches that enable network and data centre operators to route information very rapidly.

High density, low cost chips: The continuation of Moore's Law has extended far beyond what Gordon Moore himself originally envisaged, with the number of transistors on a chip continuing to double every 18 months. This will mean that computing will be 1000 times cheaper within 10 years per unit of processing capacity.

Research Roadmap for Practitioners

Taking into account the findings of the study (Schwarz et al. 2012), the driving forces as well as the key technology enablers, the following roadmap is suggested.

Practitioners should develop a sound service innovation organization diagram. One centric role that should be considered within this diagram is the role of the customer (or partner) as a co-creator, including his/her degree of participation during service

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[1] https://cloud.google.com/products/big-query retrieved: 12/19/2012

innovation idea generation, idea evaluation, and final service design. In addition, the role of firm employees needs to be defined. Employees can be divided in two generic classes. First, employees having customer contact can be used to strengthen the relationship with customers as well as to provide valuable innovation ideas to generate new services or to improve existing services. Second, back-office employees should be integrated into the innovation process as well, as they experience the internal effects of services. Therefore, they are highly valuable in identifying weak points and improvement potentials of existing services. Finally, the role of a firm's management has to be clarified and defined. Management is responsible for the allocation of resources (which are needed to exploit innovative service ideas), for setting an example of shared values and culture, and for guiding employees in developing successful service innovations.

From a technical perspective it is important to pay attention on how to connect and integrate different roles, aiming on efficient generation and exploitation of service innovations. Nowadays, there are numerous technological possibilities that provide an infrastructure for collaboration among location independent participants. One collaborative innovation management approach that should be investigated is the concept of open service innovation. Firms need to specify components, fitting their needs and overall guidelines and visions of collaborative service innovation. Closely connected to this concept are social media, web 2.0 technologies, and collective wisdom. The challenge at this point is to find ways to utilize concepts and technologies, to provide a basis for collaboration, and to exploit the benefits of service innovations. In addition, it is highly recommended to examine social networks, which might have a strong impact on team building and communication in the near future. Therefore, practitioners should question themselves on how to best use Facebook and similar sites to connect with participants.

An important aspect that feeds the transformation system is input. Input is needed to develop innovative ideas. As mentioned previously, four important sources for input exist. Currently, numerous technologies are emerging that could provide the basis for future successful service innovations. Therefore, practitioners need to deal with the concept of disruptive technologies. History provides multiple examples where disruptive technologies led to fundamental changes. Disruptive technologies can be traced back to Clayton M. Christensen, who identified sustaining and disruptive technologies. Disruptive technologies may not have proven practical fields for application, have performance problems, and may only appeal to a limited group of users. Therefore, these technologies are often considered to be without value, as no adequate ways exist to prove their value. However, there are sufficient examples where these technologies gained widespread acceptance. Hence, it is important for practitioners to find ways of identifying disruptive technologies as well as ways of utilizing their advantages within service innovations. Current emerging technologies that might be considered disruptive technologies (as there is no clear suggestion of where and how to utilize them) are: cloud computing, mixed reality, gesture recognition, ubiquitous computing, and micro blogging. It is suggested that practitioners consider the advantages of these technologies and try to find ways of utilizing them to generate service innovations. Another aspect that gets increasingly important for the generation of new ideas is "big data". Big data describes the fact that data is growing uncontrollably, and existing tools and systems can no longer cope with it. Therefore, innovative ways to store, share, and analyze this data are needed. Practitioners have to deal with the issues of big data, which is a very important source for exploring customer needs as well as possible and likely environmental changes in the Internet. In addition, not only does the Internet produce big data, but companies are generating great amounts of data as well. Analyzing this data might provide insights in identifying weak points and improvement potentials, recognized as business needs. Much research is being conducted in data mining, which is a specific field within big data. Hence, additional theoretical research and activities from practitioners in this field are strongly recommended.

In focusing on service innovations, it is important to pay attention to several aspects that affect service innovation as an output of the transformation system. Practitioners must therefore take notice of several service-related concepts and aspects that are emerging or already exist. Internet of Things is one aspect that will probably affect service innovations in the future. It aims on closing the gap between our real, physical world and the virtual world. Hence, it is necessary for practitioners to understand the basic underlying principles of the Internet of Things and to focus on possibilities of adapting it to their own business. Another very important aspect is "market of one".

Nowadays, customers want to be unique and therefore have the desire to be treated as individuals. Market of one fosters this desire by trying to implement a customization level at which each customer feels exclusive or preferred by the firm. Dealing with this concept will enable companies to provide and deliver their services to customers in an additionally satisfying manner. Therefore, practitioners have to learn about customization possibilities and find ways to deliver standardized service offers in an individualized and customized way. Closely connected to this aspect is service fascination. In addition to providing a highly customized service to a customer, it is highly recommended to design services in an outstanding way, fascinating the customer. To conclude with the output-related aspects, technology independence has to be mentioned. Service innovations that are restricted, due to a reliance on a special technology, might cause people not to use the service for several reasons. Thus, it is essential for practitioners to make their services technology independent. This might induce some additional efforts, e.g. implementing the same service for different technologies or searching for ways to build sufficient interfaces. But it might be worth it.

Continuing with the roadmap for future practical issues that should be considered, applying service innovations in service firms, the feedback loop has to be investigated. To the authors' best knowledge, there is relatively little investigation being conducted in the field of feedback. Hence, it is suggested that practitioners cope with the upcoming questions of how to measure service quality and determining sufficient service metrics. Examining quality from a goods-dominant logic reveals that quality can be measured easily. Comparing the specification of a good with its characteristics and performance outlines whether quality aspects are fulfilled or not. Investigating the quality in service-dominant logic, however, is not that easy. There is no complete definition or specification of the service, since it is co-created and exchanged with the customer at the same time. Thus, measuring service quality extremely depends on the perception of the customer, leading to the demand of finding ways to improve customer perception in the right way and at the right time. There are certainly other aspects regarding service quality; nevertheless, the comparison with the goods-dominant logic outlines that companies have to define service quality for their purposes and to develop

efficient ways of measurement. Related to this is the task of defining sufficient service metrics that are applicable in evaluating several aspects of service innovations (e.g. service quality, service performance, service reliability). It is proposed that practitioners deal with service metrics and service quality in-depth. Besides these service innovation-related aspects, companies should think and learn about collective prediction for evaluation purposes. There is no doubt that a large group or community outperforms predicting future events. However, only a few companies make use of such communities. Innovation teams should try to establish innovation communities within their firm instead of trying to do all innovation-related activities by themselves. A key activity herein is the evaluation of service innovations, which can be enhanced and improved by collective prediction. Therefore, practitioners should familiarize themselves with the principles of collective prediction and define and implement methods and structures to gain advantage from this theoretical concept for the evaluation of service innovations.

In summarizing the aforementioned aspects, practitioners should focus on the following issues in the future:

1. *Organization*: Which roles do we need to provide to cultivate an environment of successful service innovations? What are the individual roles responsible for? How do we inform and train the different participants to fulfill their roles and responsibilities?

2. *Collaboration*: How will we connect and integrate all participants? What concepts and technologies can we use to collaborate internally as well as externally with our customers and partners? How can we utilize social network approaches to foster better collaboration among participants?

3. *New technologies*: How can we identify disruptive technologies that can become valuable and identify senseful fields for their utilization? What are the advantages (and restrictions) of disruptive technologies (e.g. cloud computing, mixed reality, gesture recognition, ubiquitous computing, and micro blogging)? Where can disruptive technologies be utilized to generate service innovations?

4. *Information gathering*: How can we deal with big data? How can we analyze big data to identify

customer needs, business needs, and environmental changes?

5. *Service innovations*: What is the Internet of Things? How can we utilize the Internet of Things within our own business? How and to which level can we adopt the concept of "market of one"? How can we fascinate our customers when obtaining the service? How can we make our service innovations technology independent? (What possibilities do we have?)

6. *Evaluation*: What is service quality? How can we measure service quality? What metrics can be used to evaluate service innovations regarding quality, performance, reliability, and the like? How can we utilize collective prediction for the evaluation of service innovations?

Conclusions

The development of the service innovation roadmap for practitioners in the service sector is based on the service innovation transformation model (Figure 1) and the respective study of Schwarz et al. . Additionally, the driving forces as well as the key technology enablers are incorporated to build the roadmap.

The roadmap identifies six fields of action, covering aspects regarding organization, collaboration, new technologies, information gathering, service innovations, and evaluation. A company should define organizational roles for the service innovation processes and their responsibilities. Taking into account that the quality of decision making is increased when it is enhanced by the knowledge and creativity of individuals. These individuals provide with a wide variety of experiences and access to knowledge. Hence, collaboration in the context of decision making supported by adequate decision support approaches will improve the decision making processes and the respective results. In addition, the roadmap suggests dedicated starting points for general collaboration with service innovation management. A crucial challenge is the identification and assessment of new technologies, customer needs, and environmental changes. Companies should prepare themselves to cope with these challenges. Strategic foresight methods or trend management tools are a good starting points for this purpose. The advantages of service innovation have to be weight up against their implementation efforts and the expected

effects on the companies' business. While implementing the organizational roles and guidelines, all aspects of measuring the effect and the quality of service innovation should be considered in order to enable an effective evaluation.

With the help of this roadmap, practitioners can start coping with the changing environment and the within the service sector. On the one hand they are aware of emerging technologies that change the way of running their business and on the other hand, they are capable from an organizational point of view to use these technologies to change their business accordingly.

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